

Applicant: Darrel L. Turner
Application No.: 08/532,046
Art Unit: 3501

REMARKS

Claims 3-5 and 7-14 remain pending in the application. In the advisory Office Action dated June 23, 1997, the Examiner requested additional information on the non-obviousness of the claimed invention. Accompanying this response are documents evidencing the non-obviousness of the claimed invention. In addition, the claims have been amended to correct the spelling of --Charpy-- Notch toughness, and to correct punctuation.

An affidavit of Mr. Richard L. Wilkey accompanies this response (hereinafter "Wilkey Aff."). Mr. Wilkey is a metallurgical engineer who has been involved in the design, sale and manufacture of rotary cutting blades for original equipment manufacturers for over 27 years (Wilkey Aff. ¶ 2) and is the president of Fisher-Barton Inc., the assignee of this application (Wilkey Aff. ¶ 1).

It has been long understood in the field of rotary blade manufacture that increased hardness, while in itself desirable, was not feasible because of the decrease in toughness evidenced in conventional materials and manufacture. Blades above 45 Rockwell C were considered to be above the safety zone of the blade manufacturing industry. (Wilkey Aff., ¶ 3.)

This accepted wisdom of the industry is embodied in the 1960 ANSI Standard, excerpted from *Manual on Outdoor Power Equipment Standards*, Vol. II (Outdoor Power Equipment Institute, 1992) and is attached hereto. The 1960 ANSI Standard provides at § 2.2.5.1 with respect to "Steel Blade Material Requirements," that "The material in steel blades shall meet the following requirements: (1) The maximum hardness shall be Rockwell C value 48 at any point in the blade. ..." (P. 9.) Although in later editions of the standard, specific hardness limits were dropped for performance requirements, this 1960 standard is indicative of industry accepted wisdom with respect to maximum levels of hardness in steel blades.

The suggestion of prior learning is also illustrated by the chart forming a part of the

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Declaration of Darrel L. Turner (hereinafter Turner Decl.) which accompanies this Response. The chart shows the relation between hardness and toughness of conventional heat treated blade materials in comparison to the relationship for a boron steel blade formed according to the claimed invention. (Turner Decl. ¶ 1.) In the conventional materials, there is a substantial falling off in toughness as the hardness approaches the 48 Rockwell C level. Based on the experimental data for 5150 and 1566 steel, a hypothetical line is illustrated showing projected decreasing toughness for 10B38 steel, indicated as the "10B38 Expected" line on the chart (Turner Decl. ¶ 2). In the expected line, the toughness of 10B38 steel would be expected to fall off to an unacceptable level at hardnesses of above 48 Rockwell C. As shown by the averaged experimental data for 10B38, however, the toughness actually falls off much less than would be expected, (Turner Decl. ¶ 3) with the result that a rotary blade may be formed as in the claimed invention which performs well.

The claimed invention represents a process for producing a rotary cutting blade which proceeds contrary to the accepted wisdom of the art that blades having a toughness above 48 Rockwell C would be of unacceptably low toughness. "Proceeding contrary to accepted wisdom is evidence of nonobviousness." MPEP § 2145(j)(4) (Rev. 2, July 1996).

Customers of assignee Fisher-Barton Inc. had frequently requested blades that would last longer, be harder, and be more durable. However, with prior art processes, making the blades harder and more durable had the undesirable effect of reducing the impact strength, causing the blade to fail in a brittle mode with safety consequences to the user. (Wilkey Aff. ¶ 3.) This repeated request for a higher hardness rotary blade by customers is evidence of a long-felt and unsatisfied need for such a product as is made possible by the claimed invention. "Objective evidence of non-obviousness, such as . . . long felt but unsolved needs" is evidence of nonobviousness. *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966).

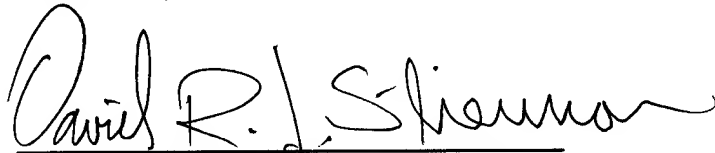
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The unobviousness of the claimed process is further evidenced by the lack of a suggestion in the prior art references for a process for making a rotary blade of boron steel and heat treated to the claimed range of hardnesses and toughnesses. MPEP 2143.01 (Rev. 2, July 1996). *Trudeau* discloses a non-rotary blade of a hardness of up to "about Rockwell C 56," but it does not disclose forming the blade from boron steel, nor of the claimed toughness. None of the applied references suggest forming a rotary cutting blade of boron steel including the step of heat treating the formed material to elevate the hardness to between 48 and 55 on the Rockwell Hardness Scale. Nor do any of the references provide any teaching, suggestion or motivation for combining or modifying a group of references to arrive at the claimed process.

It is thus respectfully submitted that the claimed invention is nonobvious as evidenced by the long felt unmet need for a rotary blade of a higher hardness and toughness, and because of the invention proceeding contrary to the accepted wisdom in the industry, and because the prior art references fail to teach or suggest the invention.

Applicant believes that no new matter has been added by this amendment, and submits that the claims, as amended, are in condition for allowance. Favorable action thereon is respectfully solicited.

Respectfully submitted,



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